

over the China sea during the 5th and 6th; on the latter date barometer at Hong Kong read 29.99, a fall of 0.13 inch in past 24 hours, wind shifted from NE. to N., with rain; Manilla, Philippine Islands, 29.83, a rise of 0.08 inch, wind shifted from SSW. to SE., followed by rain. 7th, Manilla, 29.76, SE., cloudy; to the northward along the Japan Islands the winds were northeasterly with falling barometer and cloudy or threatening weather. 8th, Manilla, 29.75, NNW., cloudy, 1.15 inches rain-fall in past 24 hours; Zi-Ka-Wei, 30.32, rain, wind NNW.; pressure rapidly falling along the southern coast of the Japan Islands. 9th, Manilla, 29.67, SW., rain; Nagasaki, 29.87, a fall of 0.27 inch in past 24 hours; Wakayama, 29.72, a fall of 0.41 inch, ENE., rain; Tokei, 29.78, a fall of 0.20 inch, NNE., rain; in 37° 10' N., 148° 24' E., 29.76, NNW., fair. 10th, Nagasaki, 29.96, N., clear; Manilla, 29.78, E., clear; Wakayama, 29.70, N., fair; Tokei, 29.54, NNE., rain; in 37° 28' N., 148° 35' E., 29.98, NNE., heavy sea, rain. 11th, depression passed to the eastward, followed over the Japan Islands by clearing weather, rapidly rising pressure and winds shifting to east and northeast; in 38° N., 148° 50' E., 29.89, NNW., heavy sea, fair; in 30° 59' N., 158° 02' E., 29.75, W., heavy squalls. On the 12th disappeared to the eastward in an area of high pressure. No. XV.—This area suddenly appeared in the vicinity of 30° N., 150° E., developing on the 14th a depression inclosed by the isobar of 29.60; in 39° 05' N., 153° 15' E., 29.47, a fall of 0.78 inch in past 24 hours, NW., clear; in 33° 19' N., 144° 23' E., 29.74, N., heavy squalls. During this day and the following the depression moved rapidly northeastward, and by morning of the 16th was lost in an area of high pressure (30.30) in the vicinity of 35° N., 165° E. No. XIX.—This depression developed over the China sea during the 17th and 18th, and moved northeastward south of the Japan Islands, disappearing on the 22d in the vicinity of 35° N., 165° E. Rain with northeasterly winds and the barometer generally above 29.90 prevailed during the 19th and 20th along the Japan coast; the depression was too far south to produce a decided effect along this coast. The following observations show the influence of the storm at Manilla, Philippine Islands: 18th, 29.84, NE., fair; 19th, 29.69 N., cloudy; 20th, 29.57 S., stormy, 4.50 inches rain-fall in past twenty-fours; 21st, 29.81, SE., very cloudy. No. XXVI.—During the 22d and 23d this storm developed over the China Sea south of the 20th parallel; 22d, Macao, 29.81, a fall of 0.13 inch in past 24 hours, wind NE., 8 hours rainfall; Manilla, 29.83, SW., cloudy; in 24° 59' N., 119° 25' E., 29.89, NNE., cloudy. 23d, Macao, 29.84, NE., cloudy; Manilla, 29.84, N. cloudy; in 22° 19' N., 115° 16' E., 29.78, WSW., cloudy. 24th, Hong Kong, 29.95, NW., fair; S. S. *Belgie*, Hong Kong, 29.86, W., cloudy; Manilla, 29.83, SW., 1.39 inches rain-fall in past 24 hours. At Nagasaki and Zi-Ka-Wei the barometer fell from 0.04 to 0.12 inch, wind NE., light rain, but from Wakayama northeastward to Yokohama, there was a slight rise, winds shifted from SW. to E. and NE. 25th, at Manilla and Hong Kong winds shifted to N. and NW., with slowly rising pressure and clear or partly cloudy weather; over Japan rain was general with easterly winds and pressure about 30.00 except at Nagasaki where the barometer read 29.92. During the day depression shifted its course more to the east leaving the Japan Islands a greater distance to the north which caused a cessation of atmospheric disturbance in that region followed on the morning of the 26th by clear and clearing weather; slightly higher pressure prevailed from Nakasaki westward, and slightly lower northeastward to Yokohama. 27th, depression disappeared over the ocean in the vicinity of 30° N., 155° E. Along the Japan coast the barometer rose from 0.10 to 0.25 inch; winds shifting to N. and NW. with clear or partly cloudy weather.

TEMPERATURE OF THE AIR.

The mean temperature of the air for October, 1881, is shown by the isothermal lines (in red) on chart No. II. The table of mean and comparative temperatures in the right hand corner of the chart shows, in the first column, the average for the month throughout the various districts, as deduced principally from observations taken at Signal Service stations. In the two remaining columns are shown the means for the present month, and the departures of such means from the average for many years. The temperature is everywhere above the normal east of a line running from the Rio Grande valley northeastward to Lake Superior. Within this extensive region of country the departures of excess range from 1°.3 in New England to 6°.5 in the Eastern Gulf states. Mount Washington shows a deficiency of 1°.1. Over the remainder of the country to the west the temperature is everywhere below the normal with but one exception, the Middle Rocky Mountain slope, where an excess of 5°.1 appears. The departures of deficiency range from 0°.8 in Minnesota to 6°.8 in the Northern Rocky Mountain slope. As a means of interesting comparison, the following maximum departures from the normal are given for each year since 1872, together with the corresponding districts: 1873, —5°.0 Upper Mississippi valley, and —4°.5 Minnesota; 1874, +3°.0 Minnesota, and +2°.9 Upper Mississippi valley; 1875, —4°.6 St. Lawrence valley, and —3°.7 South Atlantic states; 1876, —4°.0 Minnesota, and —4°.2 South Atlantic States; 1877, +4°.6 Lower Lake region; 1878, +4°.8 New England; 1879, +9°.4 Upper Mississippi valley and Minnesota; 1880, —4°.0 Rio Grande valley, and —3°.7 Southeast Rocky Mountain slope.

Ranges of Temperature at Signal Service Stations.—Monthly ranges in general varied from 35° to 50° over the country east of the Rocky Mountains and from 45° to 60° westward to the Pacific.

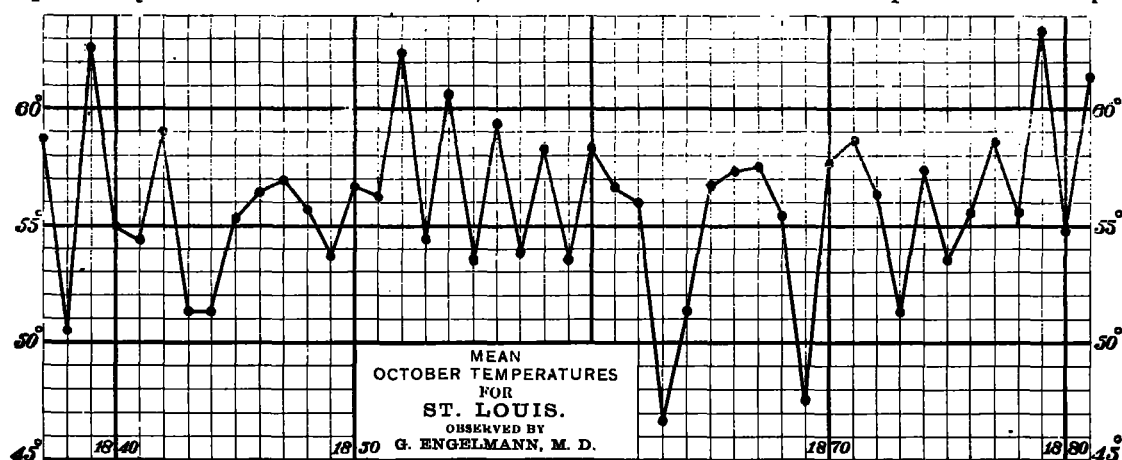
The *smallest* ranges were: Key West, 18°; Punta Rassa, 23°; Brownsville, 25°; San Diego and San Francisco, 28°; Galveston, 28°; New Orleans and Port Eads, 31°; Cedar Keys and Portland Or., 32°. The *largest* were: Ft. Assinnaboine, 74°; Eagle Rock and Campo, 69°; Ft. Benton, 67°; Prescott, 65°; Winnemucca, 64°; Florence, Ariz., 62°; Forts Shaw and Buford, 61°. The *daily* ranges varied in the different districts as follows: New England, 21° at New Shoreham and Eastport, to 37° at Boston; Middle Atlantic states, 20° at Chincoteague to 28° at Atlantic City, Washington and Norfolk; South Atlantic states, 19° at Charleston to 28° at Augusta and 29° at Wilmington; Florida Peninsula, 14° at Key West to 19° at Cedar Keys; Eastern Gulf states, 19° at New Orleans to 26° at Montgomery; Western Gulf states, 16° at Galveston to 29° at Mason and 33° at San Antonio; Ohio valley and Tennessee, 24° at Cincinnati to 28° at Morgantown and Memphis, and 30° at Pittsburgh; Lower Lake region, 24° at Sandusky to 29° at Buffalo and 38° at Rochester; Upper Lake region, 23° at Escanaba to 31° at Duluth and 33° at Port Huron; Upper Mississippi valley, 21° at La Crosse to 29° at St. Paul and 30° at St. Louis; Missouri valley, 26° at Omaha to 42° at Yankton and Fort Bennett; extreme Northwest, 37° at Fort Stevenson to 43° at Bismarck; Northern Slope, 27° at Helena to 45° at North Platte and 47° at Deadwood; Middle Slope, 39° at Fort Elliott to 40° at Denver and Dodge city; Southern Slope, 27° at Jacksboro to 40° at Stockton and 47° at El Paso; Rio Grande valley, 24° at Edinburg to 44° at Uvalde; Northern Plateau, 28° at Lewiston to 39° at Boise City and 50° at Eagle Rock; Middle Plateau, 29° at Pioche to 32° at Salt Lake City and 55° at Winnemucca; Southern Plateau, 42° at Silver City to 44° at Tucson and 51° at Fort Verde; North Pacific coast, 19° at Portland to 27° at Olympia and 28° at Roseburg; Middle Pacific coast, 19° at San Francisco to 35° at Sacramento and Red Bluff; South Pacific coast, 23° at San Diego to 37° at Visalia, Los Angeles and Yuma, and 60° at Campo.

Table of Maximum and Minimum Temperatures for October, 1881.

State or Territory.	Signal Service.			U. S. Army Post Surgeons or Voluntary Observers.			State or Territory.	Signal Service.			U. S. Army Post Surgeons or Voluntary Observers.		
	Station.	Max.	Min.	Station.	Max.	Min.		Station.	Max.	Min.	Station.	Max.	Min.
Alabama.....	Montgomery.....	92°	49°	Auburn.....	100°	44°	Mississippi.....	Vicksburg.....	90°	45°	Neosho.....	95°	
Arizona.....	Florence and San Carlos.....	98°					Missouri.....	St. Louis.....	85°	48°	Sedalia.....		29°
Do.....	Pre-cott.....	21°					Montana.....	Ft. Keogh.....	73°		Ft. Assinnaboine.....		-17°
Arkansas.....	Little Rock.....	90°	44°	Galt and Ft. Yuma.....	100°		Do.....	Ft. Assinnaboine.....	-16°		Clear Creek.....	89°	
California.....	Campo.....	89°	19°	Camp Kellogg.....	150°		Nebraska.....	Omaha.....	85°				
Do.....							Do.....	North Platte.....	25°				
Colorado.....	Denver.....	82°	28°				Nevada.....	Winnemucca.....	75°	11°	Carson City.....	75°	
Connecticut.....	New Haven.....	86°	28°	Ft. Garland.....	150°		New Hampshire.....	Mt. Wash'ton.....	54°	-3°	Auburn.....	88°	
Dakota.....	Ft. Sully.....	77°		Southington.....	86°	22°	New Jersey.....	Sandy Hook.....	87°		Vineland.....	82°	
Do.....	Ft. Buford.....	90°	30°	Ft. Hale.....	81°		Do.....	Atlantic City.....	35°		Atco.....		27°
Delaware.....	Breakwater.....	84°	49°	Ft. Buford.....	50°		New Mexico.....	La Mesilla.....	92°		Fort Union.....		18°
Dist. Columbia.....	Washington.....	92°	37°				Do.....	Ft. Bayard & Silver City.....	30°				
Florida.....	Key West.....	91°		Houston.....	95°		Do.....	N. York City.....	88°		West Point.....	83°	
Do.....	Punta Rassa.....	51°		Ft. Barrancas.....	49°		Do.....	Buffalo.....	29°		Madison Barracks.....		17°
Georgia.....	Augusta.....	90°	48°	For-yth.....	83°		North Carolina.....	Hatteras and Kittyhawk.....	90°		Weldon.....	92°	35°
Idaho.....	Atlanta.....	48°		McPherson Barracks.....	45°		Do.....	Charlotte.....	42°				
Illinois.....	Eagle Rock.....	78°	9°	Anna.....	90°		Do.....	Cincinnati & Columbus.....	84°		Jacksonburg & Portsmouth.....	86°	
Do.....	Cairo.....	88°		Elmira.....	29°		Ohio.....	Toledo.....	35°		Westerville.....		33°
Do.....	Champaign.....	39°		Laconia.....	86°	35°	Do.....	Umatilla.....	89°	21°			
Indiana.....	Indianapolis.....	81°	33°	Vevay.....	86°		Do.....	Pittsburg.....	89°	35°	Milton.....	85°	
Do.....							Pennsylvania.....						
Indian Ty.....	Ft. Supply.....	10°	24°	Des Moines.....			Do.....	Newport.....	78°	34°	Dyterry.....		20°
Iowa.....	Des Moines.....	83°	32°	Ft. Madison & Logan.....	86°		Rhode Island.....	Charleston.....	89°	54°	Fort Adams.....	81°	31°
Do.....				Oreco.....	26°		Do.....	Memphis.....	89°		Aiken.....		45°
Do.....				Wellington.....	95°		Tennessee.....	Nashville.....	89°	43°			
Kansas.....	Dodge City.....	89°	29°	Ft. Wallace.....	11°		Do.....	Edinburg.....	94°				
Do.....							Texas.....	Ft. Elliott.....	33°				
Kentucky.....	Louisville.....	87°	43°				Do.....	Salt Lake City.....	82°	25°	Coalville.....		13°
Louisiana.....	Shreveport.....	94°	47°	Cornish and Dexter.....	22°		Utah.....	Burlington.....	74°	25°	Woodstock.....	83°	17°
Maine.....	Portland.....	83°		Fallston and Federalburg.....	9.0°		Vermont.....	Cape Henry & Norfolk.....	89°		Accotink.....	91°	
Do.....	Eastport.....	24°		Woodstock.....	28°		Do.....	Chincoteague.....	4.0°		Snowville.....		31°
Maryland.....	Baltimore.....	89°	36°	Heath.....	20°		Do.....	Almota.....	72°				
Do.....				Ft. Brady.....	20°		Washington Ty.....	Dayton.....	18°				
Massachusetts.....	Boston.....	90°	28°				Do.....	Morgantown.....	84°	3.0°	Flemington.....	86°	29°
Michigan.....	Port Huron.....	78°					West Virginia.....	Madison.....	77°	33°	Edgerton.....	82°	
Do.....	Escanaba.....	25°					Wisconsin.....				Neillsville.....		24°
Minnesota.....	St. Paul.....	73°		Ft. Snelling.....	75°		Do.....	Cheyenne.....	76°	18°	Ft. Bridger.....	78°	-3°
Do.....	Moorehead.....	17°					Wyoming.....						

Deviations from Mean Temperature.—Under this heading departures exhibited by reports from the regular Signal Service stations are shown in the table of comparative temperatures on the right-hand side of chart No. II. The following items of importance in connection with this subject are reported by voluntary observers: *Illinois:* Riley, mean temperature 4° 7 above that of past 20 years; October, 1879, was the only month with a higher mean temperature; the minimum temperature for each October during the past 20 years has been lower than that of the present year and the monthly range for the present month is the smallest for the same period. *Maine:* Gardiner,

mean temperature $0^{\circ}.24$ below the average for the past 45 years. *Maryland*: Fallston, mean temperature considerably above the average for the past 10 years. Sandy Springs, warmest October for past 15 years. *Missouri*: St. Louis, the Missouri Weather Service reports: mean tempera-



ture 5° above the average of the past 45 years; this mean has been exceeded but three times since 1837; highest, $62^{\circ}.8$, occurred in 1839; lowest, $46^{\circ}.7$, occurred in 1863. *New Hampshire*: Concoctookville, mean temperature 1° above the average for past 11 years. *New York*: Waterburg, mean temperature considerably above the average for the past 10 years; highest mean temperature during this period occurred in 1879. Palermo, mean temperature $0^{\circ}.4$ above the average for the past 28 years. North Volney, mean temperature $2^{\circ}.6$ above the average for past 13 years; highest monthly mean during that period, $55^{\circ}.5$ occurred in 1879; lowest, $41^{\circ}.7$ occurred in 1876. *West Virginia*: Flemington, mean temperature 8° above the mean for October, 1880. *Virginia*: Wytheville, mean temperature $4^{\circ}.7$ above the average or the past 17 years.

Frosts.—In the various districts they were reported on the following dates: New England, 3d to 7th, 9th to 12th, 14th, 20th to 22d, 26th to 29th; Middle Atlantic states, 5th, 6th, 7th, 11th, 12th, 14th, 19th to 23d, 26th to 28th; South Atlantic states, 6th, 7th, 9th, 11th, 12th, 21st, 22d, 26th, 27th; East Gulf states, 26th; West Gulf states, 19th, 22d, 27th; Ohio valley and Tennessee, 5th, 6th, 11th, 14th, 15th, 17th to 23d, 25th to 27th; Lower Lake region, 5th, 6th, 7th, 10th, 11th, 14th, 19th, 20th, 21st, 26th to 28th; Upper Lake region, 1st, 2d, 4th to 6th; 9th to 11th, 13th, 14th, 16th to 28th, 31st; extreme Northwest, 1st to 5th, 8th, 9th, 11th to 27th, 30th; Upper Mississippi valley, 5th, 9th, 10th, 13th, 16th, 18th to 22d, 24th to 26th; Missouri valley, 8th, 9th, 13th, 15th to 21st, 23d to 26th, 30th; Northern Slope, 1st, 2d, 4th to 31st; Middle Slope, 16th to 20th, 24th, 25th, 28th, 30th; Southern Slope, 20th, 25th, 30th; Southern Plateau, 11th, 12th, 14th to 18th, 21st to 24th, 28th to 31st; Middle Plateau, 4th to 10th, 12th to 18th, 21st to 31st; Northern Plateau, 1st to 6th, 7th to 10th, 12th to 14th, 22d to 26th; North Pacific region, 1st, 3d, 11th to 14th, 21st, 24th; Middle Pacific region, 13th to 17th; South Pacific region, 3d, 6th to 8th, 14th to 23d, 31st. The following notes in reference to severe and damaging frosts have been reported: Lynchburg, Va., 6th, light frost of this morning was unprepared for; irreparable damage done to the tobacco crop standing in the fields. Southington, Conn., 6th, temperature fell to 22° ; great damage done the cabbage crop; pears were frozen on the trees; the change came so suddenly that no preparation was made for it. Westborough, Mass., 5th, great destruction of vegetables and flowers. Worcester, Mass., 5th, vegetation killed. Thornville, Mich., 11th, destructive to vegetation. Johnstown, Va., 6th, vines killed. Newport, Vt., 5th, apples frozen on the trees; great destruction of fall feed and late crops. Derby Line, Vt., 5th, ground frozen hard; much injury to grapes and other fruit. Stowe, Vt., 5th, all fruit frozen on the trees. Orleans county, Vt., 5th, many large orchards nearly ruined; large loss in apples and vegetables. Lemoore, Cal., 21st, during past week very severe frosts; fig trees, oleanders and even chrysanthemums were badly damaged; a great many house plants killed. Little Metis, Province of Quebec, 28th, grain and potatoes suffered severely. Winthrop, Mass., 6th, immense damage to crops in surrounding country; grapes completely destroyed and apples nearly so; the damage in the county to apples alone is estimated at \$25,000; late corn, pumpkins and squash were badly injured. Raleigh, N. C., 6th, tobacco crop in this section badly injured. Plummersville, N. C., 6th, very heavy; much injury to crops. Bristol, Tenn., 22d, first of season; fences perfectly white for miles about; considerable injury to fruit and other crops. Danville, Va., 6th, tobacco severely injured. Richmond, Va., 6th, very general throughout the state, and doing incalculable damage, especially to the tobacco crop; at least one-half of the standing crop has been destroyed; in some portions of the State the condition is even worse; one farmer is reported to have lost 80,000 plants, while the joint loss of two others is estimated at what would fill sixty barns. South Carolina, 6th, in northern portions of State the late growth of cotton has been destroyed. Milford, N. H., 5th, squashes, grapes and vegetables badly

damaged; ground frozen. East Northwood, N. H., 5th, crops and fruit severely injured. Hanover, N. H., 5th, first of the season; ground frozen so hard that the crust would bear up a horse; late fruit severely injured. Portsmouth, N. H., 5th, great damage to fruits and gardens; Warner, N. H., 5th, fruit frozen on the trees and house plants were frozen in-doors. Contoocook, N. H., 5th, fruit, squashes and other crops badly damaged. Plymouth, N. H., 5th, ground in some places frozen to a thick crust; fruit and vegetables injured. Wolfboro, 5th, most extreme and sudden change of weather ever known here; thermometer fell from 80° Monday noon to 28° Tuesday night; ground was frozen, and throughout this region grapes, squashes, pumpkins, plants and vines were severely damaged.

Table of Comparative Maximum Temperatures for the month of October.

State or Territory.	Maximum for October, 1881, Signal Service.		Highest since Signal Service stations were opened—3 to 10 years.			Highest from any other source.		
	Station.	Temp.	Station.	Temp.	Year.	Place.	Temp.	Length of Record.
Alabama.....	Montgomery.....	92°	Mobile.....	90°	1879	Mount Vernon Arsenal.....	98°	31 years.
Arizona.....	Florence and San Carlos.....	98°	Stanwix.....	103°	1878	Fort McJwell.....	108°	14 "
Arkansas.....	Little Rock.....	90°	Little Rock.....	89°	1879	Fort Smith.....	91°	21 "
California.....	Campana.....	89°	Los Angeles.....	96°	1879	Little Rock.....	90°	37 "
Colorado.....	Denver.....	82°	Denver.....	85°	78, 77	Fort Yuma.....	105°	30 "
Connecticut.....	New Haven.....	86°	New Haven and New London.....	83°	1879	Fort Lyon.....	92°	19 "
Dakota.....	Ft. Sully.....	77°	Ft. Buford.....	95°	1879	Columbia.....	88°	9 "
Delaware.....	Delaware Breakwater.....	84°	Breakwater.....	78°	1880	New Haven.....	83°	87 "
Dist. of Columbia.....	Washington.....	92°	Washington.....	92°	1879	Fort Trumbull.....	77°	47 "
Florida.....	Key West.....	91°	Key West.....	91°	75-77	Fort Buford.....	98°	8 "
Georgia.....	Augusta.....	90°	Augusta.....	89°	1871	Fort Delaware.....	88°	44 "
Idaho.....	Eagle Rock.....	78°	Boise City.....	85°	79, 80	Washington.....	90°	48 "
Illinois.....	Cairo.....	88°	Springfield.....	88°	1879	Fort King.....	89°	10 "
Indiana.....	Indianapolis.....	81°	Indianapolis.....	86°	1879	Augusta Arsenal.....	92°	48 "
Indian Territory.....	Ft. Supply.....	90°	Fort Sill.....	91°	1878	Fort Boise.....	95°	16 "
Iowa.....	Des Moines.....	83°	Keokuk.....	87°	1879	Chicago.....	90°	47 "
Kansas.....	Dodge City.....	89°	Leavenworth.....	89°	1874	Manchester.....	90°	10 "
Kentucky.....	Louisville.....	87°	Louisville.....	88°	1879	Vevay.....	96°	15 "
Louisiana.....	Shreveport.....	94°	Shreveport.....	90°	1878	Fort Sill.....	90°	10 "
Maine.....	Portland.....	83°	Portland.....	83°	1879	Fort Gibson.....	95°	52 "
Maryland.....	Baltimore.....	89°	Baltimore.....	89°	1879	Muscatine.....	87°	26 "
Massachusetts.....	Boston.....	90°	Boston.....	88°	1879	Fort Larned.....	98°	14 "
Michigan.....	Port Huron.....	79°	Marquette.....	87°	1879	Fort Leavenworth.....	94°	49 "
Minnesota.....	St. Paul.....	72°	Breckenridge.....	89°	1879	Chilesburg.....	88°	3 "
Mississippi.....	Vicksburg.....	90°	Vicksburg.....	91°	1879	Newport Barracks.....	85°	28 "
Missouri.....	St. Louis.....	85°	St. Louis.....	90°	1879	New Orleans.....	96°	50 "
Montana.....	Ft. Keogh.....	73°	Ft. Custer.....	87°	1879	Brunswick.....	88°	52 "
Nebraska.....	Omaha.....	85°	North Platte.....	89°	1879	Fort Washington.....	92°	37 "
Nevada.....	Winnemucca.....	75°	Winnemucca.....	84°	1879	Topsfield.....	87°	6 "
New Hampshire.....	Mount Washington.....	54°	Mount Washington.....	57°	77, 79	Monroe.....	89°	10 "
New Jersey.....	Sandy Hook.....	87°	Sandy Hook.....	89°	1879	Ontonagon.....	89°	11 "
New Mexico.....	La Mesilla.....	92°	La Mesilla.....	96°	1879	Fort Snelling.....	90°	61 "
New York.....	New York City.....	88°	New York City.....	88°	1879	Vicksburg.....	90°	4 "
North Carolina.....	Hatteras and Kittyhawk.....	90°	Portsmouth.....	89°	1879	Columbus.....	89°	9 "
Ohio.....	Cincinnati and Columbus.....	84°	Toledo.....	88°	1877	Allentown.....	100°	3 "
Oregon.....	Umatilla.....	69°	Umatilla.....	86°	1880	Fort Shaw.....	91°	7 "
Pennsylvania.....	Pittsburg.....	89°	Pittsburg.....	91°	1879	Fort Mc'herson.....	102°	14 "
Rhode Island.....	Newport.....	78°	Newport.....	81°	1879	Fort Ruby.....	101°	5 "
South Carolina.....	Charleston.....	80°	Charleston.....	87°	1879	Concord.....	80°	7 "
Tennessee.....	Memphis and Nashville.....	89°	Knoxville.....	96°	1879	Fort Constitution.....	79°	33 "
Texas.....	Edinburgh.....	94°	Rio Grande and Uvalde.....	105°	1877	Newark.....	83°	9 "
Utah.....	Salt Lake City.....	82°	Salt Lake City.....	83°	1876	Fort Cummings.....	100°	4 "
Vermont.....	Burlington.....	74°	Burlington.....	78°	1879	Poughkeepsie.....	95°	20 "
Virginia.....	Cape Henry and Norfolk.....	80°	Ft. Whipple.....	90°	1879	Fort Johnson.....	90°	54 "
Washington T'y.....	Almota.....	72°	Dayton.....	92°	1880	College Hill.....	90°	56 "
West Virginia.....	Morgantown.....	84°	Morgantown.....	85°	1879	Marietta.....	88°	53 "
Wisconsin.....	Madison.....	77°	La Crosse and Madison.....	84°	1879	Fort Dalles.....	100°	16 "
Wyoming.....	Cheyenne.....	76°	Cheyenne.....	80°	74, 75	Mount Joy.....	90°	9 "
						Philadelphia.....	88°	112 "
						Carlisle Barracks.....	89°	34 "
						Providence.....	85°	35 "
						Charleston.....	89°	104 "
						Fort Moultrie.....	88°	27 "
						Glenwood Cottage.....	88°	10 "
						Fort McIntosh.....	104°	25 "
						Fort Douglas.....	99°	18 "
						Lunenburg.....	83°	8 "
						Fortress Monroe.....	89°	54 "
						Fort Walla Walla.....	88°	10 "
						Helvetia.....	86°	4 "
						Fort Crawford.....	86°	25 "
						Fort Howard.....	84°	30 "
						Fort Laramie.....	90°	26 "

Ice.—The following stations report its formation: Princeton, Oakland and Alameda, Cal., 14th. Roseburg, Or., 14th. Boise City, Idaho, 7th, $\frac{1}{2}$ inch; 13th. Prescott, Ariz., 15th, 17th, to 20th, 22d, 30th. Deadwood, Dak., 14th, $\frac{1}{2}$ inch; 15th, $\frac{3}{4}$ inch; 16th, 17th. Cheyenne, Wyo., 12th, 13th, 14th. Ft. Buford, Dak., 4th. Huron, Dak., 12th. Yankton, Dak., 12th, 13th. St. Paul, Minn., 5th. Duluth, Minn., 13th. Oswego, 5th. Flushing and Port Jervis, N. Y., 5th. Poughkeepsie, N. Y., 5th, $\frac{1}{2}$ inch. Ardenia, N. Y., 5th, 6th, $\frac{1}{2}$ inch. Buffalo, 5th. Rochester, 27th. Bangor, Me., 5th, on quiet pools from 2 to 3 inches; 26th. Wood's Holl, Mass., 5th. Thatchers Island, Mass., 2d. Cambridge, Mass., 10th, 11th, 26th, 27th. Rowe, Mass. 5th, $\frac{1}{2}$ to

$\frac{1}{2}$ inch; 6th, 11th. Springfield, Mass., 5th, 6th. New London, 5th, 6th. Boston, 27th. Burlington, Vt., 14th, 26th. New Haven, 5th. Wabash, Ind., 5th. Nora Springs, Ia., 20th. Clay Centre, Kan., 18th, $\frac{1}{4}$ inch. Orono, Me., 5th, $\frac{1}{4}$ inch. Dexter, Me., 5th. Fallston, Md., 6th, thin film. Litchfield, Mich., 19th. Niles, Mich., 19th. Thornville, Mich., 24th. Clear Creek, Neb., 13th, 20th. Genoa, Neb., 13th, 18th, 24th. Howard, Neb., 18th, $\frac{1}{4}$ inch. Grafton, N. H., 5th, $\frac{1}{2}$ inch. Contoocookville, N. H., 5th, $\frac{1}{2}$ inch. Ruggles, Ohio, 11th. Charlotte, Vt., 5th, 27th. Accotink, Va., 6th. Johnsonville, Va., 6th. Derby Line, Vt., 5th, $\frac{1}{4}$ inch. Newport, Vt., 5th, $\frac{1}{4}$ inch. Stowe, Vt., 5th, $\frac{1}{4}$ to $\frac{1}{2}$ inch. Milford, N. H., 5th, $\frac{3}{4}$ inch. Warner, N. H., 5th, $\frac{1}{2}$ inch. Plymouth, N. H., 5th, $\frac{1}{4}$ to $\frac{1}{2}$ inch. Bradford, Pa., 5th, 1 inch. London, Province of Ontario, 5th, $\frac{1}{4}$ inch. British Columbia, 14th; cold weather has been very severe for several days; ice formed every night.

PRECIPITATION.

The general distribution of rain-fall for the month of October, 1881, is shown on chart No. III from the reports of over 500 stations. From the table in the left-hand corner of the chart is obtained a monthly average for each of the various districts, determined from the records (covering a period of many years) of Signal Service stations, and also a comparison of the present month with such averages. Upon examining the chart a decided excess in the monthly rain-fall is found to prevail over the central portion of the country, the departures ranging from 0.22 inch in the Eastern Gulf states to 4.52 inches in the Upper Mississippi valley. The area of deficiency is confined to the Atlantic coast and except a slight excess in the Middle Atlantic states prevails from the Canadian Maritime Provinces southwestward to include Florida, the departures ranging from 0.90 inch in New England to 4.00 inches in the Florida Peninsula. On Mt. Washington there appears to be a very large excess, the total monthly rain-fall measuring 18.38 inches. On the Pacific coast a comparison with the average shows a range of from normal in the South Pacific region to +1.68 inches in the North Pacific region. As a means of interesting comparison, the following maximum departures from the average are given for each year since 1872, together with the corresponding districts: 1873, large excess, New England and Middle Atlantic states; 1874, -3.85 inches, Western Gulf states and -3.10 inches, New England; 1875, -1.40 inches, Lower Missouri valley and Middle Atlantic states, and +1.30 inches, North Pacific region; 1876, +5.15 inches, South Atlantic states and -2.35 inches New England; 1877, +5.88 inches Western Gulf states; 1878, +2.35 inches, Minnesota; 1879, +3.18 inches, Eastern Gulf States; 1880, +3.36 inches, Florida Peninsula.

Deviations from Average Precipitation.—Under this heading departures exhibited by the reports from the regular Signal Service stations are shown in the table of comparative monthly rain-fall in the lower left-hand corner of chart No. III. The following items of importance in connection with this subject are reported by voluntary observers: *Connecticut*: Southington, monthly rain-fall considerably below the average for the past 11 years. *Indiana*: Wabash, monthly rain-fall double the average of several years past. *Illinois*: Riley, monthly rain-fall 4.53 inches above the average for the past 20 years and 0.24 inch greater than the largest rain-fall during that period. *Maine*: Gardiner, monthly rain-fall 1.90 below the average for the past 45 years. *Missouri*: St. Louis, Missouri Weather Service reports monthly rain-fall considerably above the average for the past 45 years. *New Hampshire*: Contoocookville, monthly rain-fall about 1.50 inches below the October average for the past 11 years. *New York*: Palermo, monthly rain-fall equals the normal or the average of the past 28 years. North Volney, monthly rain-fall 0.12 above the average of the past 9 years. *West Virginia*: Flemington, monthly rain-fall considerably less than the average and 1.00 inch less than that of October, 1880.

Special Heavy Rains.—1st, Mt. Ida, Ark., 2.00 inches in 6 hours and 50 minutes; Franklin, Ark., 3.48; Denison, Tex., 2.82; Eagle Pass, Tex., 3.18; Lexington, Mo., 3.83; Ft. Smith, Ark., 3.75. 1st and 2nd, Pierce City, Mo., 4.50; Brackettville, Tex., 13.08, of which 10.97 fell in 8 hours. 2d, Blooming Grove, Penn., 2.90; Toledo, 3.10 in 12 hours; Ft. Scott, Kansas, 1.80 in 20 minutes. 2d and 3d, Springfield, Ill., 5.74. 4th, Vevay, Ind., 1.20, in 40 minutes. 4th and 5th, Yates Centre, Kan., 2.40, during late night and early morning. 6th, Swanwick, Ill., 2.25, in 1 hour and 45 minutes. 6th and 7th, Manitowoc, Wis., 3.30. 8th, Laredo, Tex., 3.53. 9th, Anna, Ill., 3.20; Ft. Davis, Tex., 2.82. 11th, Northfield, Minn., 2.84. 11th and 12th, Neillsville, Wis., 3.20. 12th, St. Joseph, Mo., 3.63. 15th, Mt. Washington, 2.87. 16th and 17th, Nora Springs, Ia., 3.00. 17th, Charleston, Ill., 2.50; Grand Haven, 3.04; St. Joseph, Mo., 3.60. 18th, Eastport, Me., 2.76. 20th and 21st, Mayport, Fla., 3.41. 23d, Pensacola, Fla., 2.65; Galveston, 2.96. 24th and 25th, Brownsville, Tex., 3.35. 27th, Shreveport, 3.80. 27th and 28th, Vicksburg, 6.59; Fayette, Miss., 6.20. 28th, Charleston, Ill., 2.50. 29th and 30th, Highlands, N. C., 8.27. 30th and 31st, Emmitsburg, Md., 3.52.

Largest Monthly Rain-falls.—Mt. Washington, N. H., 18.38 inches; Brackettville, Tex., 16.17; New Ulm, Tex., 12.44; Nora Springs, Ia., 11.70; Kirksville, Mo., 11.30; St. Joseph, Mo., 11.24; Highlands, N. C., 10.83; Hannibal, Mo., 10.70; Edinburg, Tex., 10.54; Galveston, 10.33; Alpena, Mich., 10.25; Northport, Mich., 10.19; Springfield, Ill., 10.02; Vicksburg, 9.69; Madison, Wis., 9.10; Louisiana, Mo., 8.95; Macon, Mo., 8.88; Manitowoc, Wis., 8.81; Fayette, Miss., 8.80;